Hazardous Waste Management & Regulatory Guidance for Laboratories

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Hazwaste container in a lab hood

Accumulation of hazardous waste

- Lack of proper hazardous waste labeling on containers and tanks are common.
- Waste labeling begins at the point of waste generation.
- Person who first created the waste should be responsible for the labeling and content of the label.

What can be done to address waste accumulation challenge

- Have prepared hazardous waste labels in the labs. Keep a stock of labels ready.
- Training important (and refresher trainings).
- Weekly inspections by lab safety person.
- Unknowns and unlabeled containers, don’t wait, address these right away.

Leaking container

Leaked chemical in a tray in cabinet at lab

Spills/Leak of Chemicals

- Clean up right away. Manage cleanup materials properly.
- Waste classification done during spill cleanup.
- Good housekeeping and lab chemical hygiene important.
- Dirty, unorganized labs usually get the most violations when inspected.
- Train employees about spill cleanup, their role, and facility's standard operating procedure.

Temporary or Contract Lab Workers

- Staff hired as temporary workers and contract lab personnel, have seen major non-compliance problems during hazardous waste inspections.
- Facility EH&S should watch those labs in particular.
- Weekly self inspections highly recommended.
- Follow-up on weekly inspection deficiencies.

Waste waiting for classification and labeling

Waste waiting for classification and labeling

Don’t wait for the hazardous waste transporter to do the waste classification

- Law requires the waste classification to be done at the moment the chemical is a waste.
- Waste generator must do the classification and labeling of waste.
- Ensure the waste transporter has knowledgably technicians performing the waste packaging and lab packing. Are they wearing appropriate PPE!

Incompatible waste in lab hood next to each other in same tray

Segregate incompatible hazardous waste

http://cameochemicals.noaa.gov/search/simple

- Don't store incompatible hazardous waste next to each other. Or on top of each other.
- Be sure lab workers know the incompatible wastes they are generating and how to store the waste. And where to store it.
- Many 'lessons learned' at websites:

http://ucih.ucdavis.edu/docs/se261explosion.pdf

http://www.aiha.org/insideaiha/volunteergroups/labHandScommittee/Pages/WasteSolventExplosionandFire.aspx

No aisle space at 90 day waste storage area

Aisle space for waste storage is important

- Regulation requires aisle space around hazardous waste containers.
- To allow for emergency response actions and close-up inspection if needed.
- Cluttered and disorganized waste storage areas attract more clutter and inspector scrutiny.

Waste containers on their sides

Waste containers on their sides with other waste

Storage of waste haphazardly

- Don’t store waste containers on top of each other.
- Don’t store waste containers on their sides or upside down.
- Assign facility EH&S technician to keep watch over the waste storage areas and condition.
- If the technician is not doing the job, then a accident, leak, spill…. is more likely.
- Glass containers, need more care.
- Anticipate waste storage need and plan accordingly. Over-accumulation of waste can and does occur.

Corroded waste container, past leakage from unknown waste

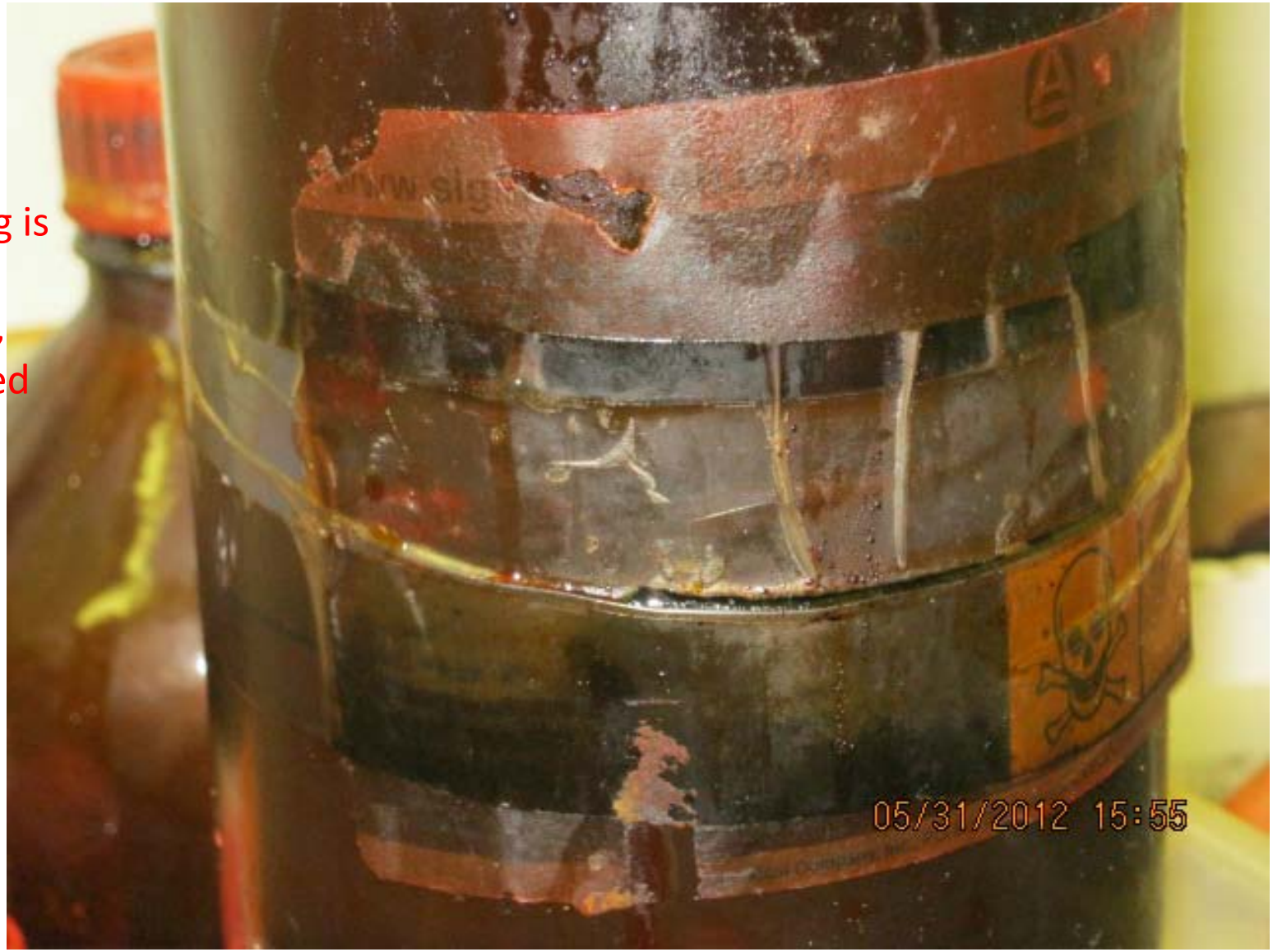
Corroded waste container

Corroded waste container, labeling gone

Corroded containers are troublesome

- Corroded containers can be a indicator of aged chemicals or off.spec materials.
- Will the container fall apart when handled.
- Difficult/hazardous to open sometimes.
- Preventable hazard to employees and safety if managed properly before corrosion get worse.
- Lab personnel will usually shun the corroded chemical container and order/get a fresh stock for their lab work & research.

Labeling is faded, stained, damaged



Label is falling off, torn, or illegible

- Chemical containers which have damaged/faded-out labels are a risk. Hard to read the label.
- Lab personnel may shun the chemicals with damaged labels and order/get new stock.
- Inspectors will scrutinize the damaged labels and contents.
- These cabinets or shelves seem to attract other unwanted relatives, brothers and sisters, and before you know it, the problem has multiplied.

Open hazardous waste container

Open hazardous waste container

Open containers not okay

- Open hazardous waste containers are common.
- Must be kept closed except when using (eg..adding to it or pouring out).
- Train staff and inspect labs routinely.
- Open waste containers draw inspector scrutiny.
- Leaving hazardous waste containers open in lab hood is a observed problem. Evaporation of hazardous waste for disposal is a problem.

Out of state lab personnel

- Persons from another State or country may not be familiar with California's hazardous waste classification and regulations.
- Training of those persons a must.
- Watch out for lab chemicals sink disposal of chemical waste down the drain.
- Put signs at sinks telling users not to pour hazardous waste down the drain.
- If English is a second language, provide training/signage/labeling in their native language (usually OSHA mandated anyway)

Lab hood
in disarray

Lab hood
in disarray

Bottle beard


Bottle
whiskers


Bottle
beard
ALDRICH
Acetonitrile
OPTIMA

Bottle beards

- Chemical containers with bottle ‘beards’ are risk.
- Consider why are the crystals, powder forming on the cap or lid.
- Be cautious, can indicate a unsafe condition, such as a aged chemical that is unstable.
- Use good PPE to protect health.
- Containers will draw inspector scrutiny.
- Usually the container label is illegible and partially deteriorated, stained, faded, etc..
- Lab workers will usually reject these containers and order fresh stock for their lab work.


VWR
VWR
GLASS
DISPOSAL
VWR

Contaminated lab glassware and chemical containers

- Emphasize to all lab staff that glassware boxes are for California-empty (*drip dry*) containers and disposable lab devices (used pipettes, etc.)
- Inspectors have seen chemical bottles inside the disposal glass boxes that were <u>not empty</u>.
- Extremely hazardous waste containers are a special category, and these containers require additional regulation (triple rinsing).
- Signage/label at these boxes can be helpful.


Bulging
waste
drum


Bulging
waste
drum
HAZARDOUS
WASTE


Bulging waste
drum, red brown
vapors and gas
spewed out when
drum bung started
to be unscrewed
by PPE protected
hazmat responder

Pressurized or bulging containers

- These containers are a threat.
- Consider why is the container bulging?
- What to do next?
- Is it an emergency situation.
- Proper PPE and safety a must.
- Contact the County Hazmat team for advice.
- Do not ignore the bulging container, they rarely pull back on their own. Usually will pop their content and hopefully no one is exposed or injured.

Compressed gas cylinder hazardous waste

- Have a adequate plan to deal with compressed gas cylinders hazardous waste.
- If they are not empty, they are a risk.
- The cylinder supplier is a good resource.
- Lecture bottles are a special challenge. Vendor may not take them back.
- Do not open cylinder valve to purposefully dispose of unwanted contents.
- Do not give to scrap metal company if not empty (recommend de-valving *(must be empty first!)* if scrap metal).
- Extremely hazardous gas cylinders require additional special handling and disposal.

http://www.cuhwc.net/2008/papers/CompressedGas.pdf Good overview of how UC Berkley managed waste

Unwanted Lecture Bottles: What a Gas! Presented by:
Kelley Etherington & Phil Kruse
UC Berkeley EH&S

UC Berkeley disposed of almost 150 compressed gas cylinders that could not be returned to the vendor.

- Published guideline (booklet)
- Create web page
- Get a list of unwanted gases
- Obtain disposal quotes
- Seek funding
- Obtain disposal contractor
- Dispose of unwanted cylinders

Universal Waste storage and disposal

California universal wastes are:

1. **Electronic devices:** Includes any electronic device that is a hazardous waste (with or without a Cathode Ray Tube (CRT)), including televisions, computer monitors, cell phones, VCRs, computer CPUs and portable DVD players.
2. **Batteries:** Most household-type batteries, including rechargeable nickel-cadmium batteries, silver button batteries, mercury batteries, alkaline batteries and other batteries that exhibit a characteristic of a hazardous waste
3. **Electric lamps**: Fluorescent tubes and bulbs, high intensity discharge lamps, sodium vapor lamps and electric lamps that contain added mercury, as well as any other lamp that exhibits a characteristic of a hazardous waste. (e.g., lead).
4. **Mercury-containing equipment:** Thermostats, mercury switches, mercury thermometers, etc..
5. **CRTs:** The glass picture tubes removed from devices such as televisions and computer monitors. CRT glass: A cathode ray tube that has been accidently broken or processed for recycling.
6. **Non-empty aerosol cans**

http://www.dtsc.ca.gov/HazardousWaste/UniversalWaste/upload/UW_Factsheet1.pdf DTSC factsheet about waste handling and disposal.

The end

Resources:

http://cers.calepa.ca.gov/business CERS website

http://cclearn.csus.edu/wasteclass/intro/intro_01.html DTSC online, self-paced waste classification training

http://www.dtsc.ca.gov/ DTSC website

http://www.sdcounty.ca.gov/deh/hazmat/hazmat_permits.html County website for unified program permits, etc..